

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application. An identifier indicating the status of each claim is provided.

Listing of Claims

1. (currently amended) A signal processing system comprising:
  - a decoder for decoding a first compressed digital video bitstream whilst preserving the compression parameters thereof, the compression parameters including a first buffer occupancy value  $V\_1$  representing the occupancy by the said first bitstream of a buffer of the decoder;
  - a signal processor for processing the decompressed bitstream; and
  - an encoder for compressing the processed bitstream to produce a second compressed bitstream having a target bit rate, ~~optionally~~ with reuse of the said compression parameters of the first bitstream, the second bitstream having a second occupancy value  $V\_2$  representing the occupancy of a downstream decoder buffer by the said second bitstream;
    - wherein the encoder controls (i) the target bit rate of the second bitstream and (ii) the recoding of the second bitstream to meet the said target bit rate,
    - the target bit rate being varied in dependence on one or both of (a)  $V\_2$  and (b) the difference between  $V\_1$  and  $V\_2$ , and
    - the degree of reuse of the said preserved parameters being varied in dependence on one or both of (a) the degree to which  $V\_2$  tends towards underflow and (b) the degree to which  $V\_1$  differs from  $V\_2$  tending towards underflow.

2. (original) A system according to claim 1, wherein if  $V\_2$  is within a predetermined range of underflow of the downstream buffer, then the second bitstream is encoded without reuse of the preserved parameters, otherwise the second bitstream is encoded with reuse of at least some preserved parameters.

3. (original) A system according to claim 2, wherein if the difference between  $V\_2$  and  $V\_1$  exceeds a predetermined threshold value tending towards underflow of the downstream buffer, then the second bitstream is encoded without reuse of the preserved parameters, otherwise the second bitstream is encoded with reuse of at least some preserved parameters.

4. (original) A system according to claim 3, wherein the compressed bitstreams comprise groups of intra frames and predicted frames, and if  $V\_2$  is less than a first  $V\_2$  threshold value  $Th1$  then the target bit rate is reduced by a small amount, and preserved transcoding parameters are reused on intra frames and at least some predicted frames.

5. (previously presented) A system according to claim 3, wherein the compressed bitstreams comprise groups of intra frames and predicted frames, and if  $|V2-V1|$  is greater than a first  $(V2-V1)$  threshold, then the target bit rate is reduced by a small amount, and preserved transcoding parameters are reused on intra frames and at least some predicted frames.

6. (previously presented) A system according to claim 4, wherein the groups of frames include I, P and B frames and I and P frames are recoded with reuse of the preserved parameters, and B frames are recoded without reusing preserved parameters.

7. (previously presented) A system according to claim 4, wherein if  $V_2$  is less than a second threshold value  $Th2$ , which is less than the said first threshold  $Th1$  then the target bit rate is reduced by a medium amount, and preserved transcoding parameters are reused on intra frames but not on predicted frames.

8. (previously presented) A system according to claim 4, wherein if  $|V_2 - V_1|$  is greater than a second  $(V_2 - V_1)$  threshold but less than a third  $(V_2 - V_1)$  threshold then the target bit rate is reduced by a medium amount, and preserved transcoding parameters are reused on intra frames but not on predicted frames.

9. (previously presented) A system according to claim 4, wherein if  $V_2$  is less than a third threshold value  $Th3$ , which is less than the said second threshold  $Th2$ , then the target bit rate is reduced by a large amount, and preserved transcoding parameters are not reused on any frames.

10. (previously presented) A system according to claim 4, wherein if  $|V_2 - V_1|$  is greater than said third  $(V_2 - V_1)$  threshold then the target bit rate is reduced by a large amount, and preserved transcoding parameters are not reused on any frames.

11. (previously presented) A system according to claim 1, wherein stuffing bits are added to the bitstream if  $V_2$  is tending towards overflow of the downstream buffer and/or  $V_2$  differs from  $V_1$  tending towards overflow.

12. (currently amended) A signal processing system comprising:  
a decoder for decoding a first compressed digital video bitstream whilst preserving the compression parameters thereof, the compression parameters including a first buffer occupancy value  $V_1$  representing the occupancy by the said first bitstream of a buffer of the decoder;  
a signal processor for processing the decompressed bitstream; and  
an encoder for compressing the processed bitstream to produce a second compressed bitstream having a target bit rate, optionally with reuse of the said compression parameters of the first bitstream, the second bitstream having a second occupancy value  $V_2$  representing the occupancy of a downstream decoder buffer by the said second bitstream;  
wherein the encoder controls (i) the target bit rate of the second bitstream and (ii) the recoding of the second bitstream to meet the said target bit rate, and  
if  $V_2$  is tending towards overflow of the downstream buffer and/or  $V_2$  differs from  $V_1$  tending towards overflow of the downstream buffer, the encoder adds stuffing bits to the bitstream and recodes the second bitstream reusing the said preserved parameters.

13. (original) A system according to claim 12, wherein if  $V_2$  is within a threshold range of the buffer size or  $(V_2-V_1)$  exceeds a further threshold level tending towards overflow, then stuffing bits are added to the bitstream.

14. (previously presented) A system according to claim 12, wherein the said signal processor comprises one or more of: a store for storing the bitstream; and a communications channel for transferring the bitstream from the decoder to the encoder.

15. (previously presented) A system according to claim 12, wherein the said signal processor comprises an editing apparatus.

16. (previously presented) A system according to claim 1, wherein the said signal processor comprises an intra-frame encoder to produce an intra frame bitstream, an intra frame signal processor and a decoder for decoding the processed intra frame bitstream to produce the said processed decompressed bitstream.

17. (currently amended) A method of processing a signal comprising the steps of:

decoding a first compressed digital video bitstream whilst preserving the compression parameters thereof, the compression parameters including a first buffer occupancy value  $V\_1$  representing the occupancy by the said first bitstream of a buffer of the decoder;

processing the decompressed bitstream; and

compressing the processed bitstream to produce a second compressed bitstream having a target bit rate, optionally with reuse of the said compression parameters of the first bitstream, the second bitstream having a second occupancy value  $V\_2$  representing the occupancy of a downstream decoder buffer by the said second bitstream;

wherein the encoding controls (i) the target bit rate of the second bitstream and (ii) the recoding of the second bitstream to meet the said target bit rate, the target bit rate being varied in dependence on one or both of (a)  $V\_2$  and (b) the difference between  $V\_1$  and  $V\_2$ , and the degree of reuse of the said preserved parameters being varied in dependence on one or both of (a) the degree to which  $V\_2$  tends towards underflow and (b) the degree to which  $V\_1$  differs from  $V\_2$  tending towards underflow.

18. (currently amended) A method of processing a signal comprising the steps of:

decoding a first compressed digital video bitstream whilst preserving the compression parameters thereof, the compression parameters including a first buffer occupancy value  $V\_1$  representing the occupancy by the said first bitstream of a buffer of the decoder; processing the decompressed bitstream; and compressing the processed bitstream to produce a second compressed bitstream having a target bit rate, ~~optionally~~ with reuse of the said compression parameters of the first bitstream, the second bitstream having a second occupancy value  $V\_2$  representing the occupancy of a downstream decoder buffer by the said second bitstream; wherein the encoding controls (i) the target bit rate of the second bitstream and (ii) the recoding of the second bitstream to meet the said target bit rate, and if  $V\_2$  is tending towards overflow of the downstream buffer and/or  $V\_2$  differs from  $V\_1$  tending towards overflow of the downstream buffer, the encoder adds stuffing bits to the bitstream and recodes the second bitstream reusing the said preserved parameters.

19. (previously presented) A computer program product arranged to carry out the method of claim 17, when run on a programmable digital signal processing system.

20. (previously presented) A system according to claim 1, wherein the said signal processor comprises one or more of: a store for storing the bitstream; and a communications channel for transferring the bitstream from the decoder to the encoder.

21. (previously presented) A system according to claim 1, wherein the said signal processor comprises an editing apparatus.

22. (previously presented) A system according to claim 12, wherein the said signal processor comprises an intra-frame encoder to produce an intra frame bitstream, an intra frame signal processor and a decoder for decoding the processed intra frame bitstream to produce the said processed decompressed bitstream.

23. (previously presented) A computer program product arranged to carry out the method of claim 18, when run on a programmable digital signal processing system.